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Rev. 07/10/02

HEALTH AND SAFETY PROJECT SUMMARY
RAPID RESPONSE LEAD CONTAMINATION REMEDIATION FOR NL INDUSTRIES/TARACORP SUPERFUND SITE IN GRANITE CITY, VENICE, AND MADISON, ILLINOIS

Submitted to:

Department of the Army
Corps of Engineers
Omaha, Nebraska

Prepared by:

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September 3, 1993
Project # 13407

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1.0 INTRODUCTION

2.1 Work for this project involved excavation and disposal of lead contaminated fill material placed in alleys, parking lots, driveways and yards in residential communities located in Granite City, Madison, and Venice, Illinois.

2.2 The NL Industries/Taracorp Plant is a former secondary lead smelting operation. Property adjacent to the plant was used to separate wastes for recycling. Lead contaminated battery casings were crushed and used as fill material in residential communities in and around Granite City, Illinois.

2.0 PROJECT SUMMARY AND CONCLUSIONS

2.1 SUMMARY

2.1.1 One amendment was made to the Site Safety and Health Plan (SSHP) to address changes made to the level of personal protection required. Refer to Exhibit I of this report for a copy of the amendment.

2.1.2 One OSHA recordable accident took place on-site. The accident did not result in any lost work time and appropriate provisions were made to prevent future incidents.

2.1.3 Task specific hazard evaluations were performed each day at each work site prior to the start of work.

2.1.4 Air monitoring data was used at this project to ensure that appropriate personal protection was being used for site conditions. Personnel medical monitoring was performed prior to and at the end of the project to determine lead levels in the blood.

2.1.5 MINIRAM data was used to determine when dust control measures should be implemented to prevent/control exposure as well as perimeter emissions. Data collected indicated 26 instances where the action level was exceeded; visual criteria was used to determine when to implement dust control.

2.1.6 Perimeter sampling data for total lead indicated 10 samples with concentrations above the detection limit. Visible dust emanating from the site perimeter was used as criteria for implementing dust control.

2.1.7 Personnel air sampling data indicated 13 detectable readings for total lead. Only four of those exceeded the action level of 15.0 $\mu g/m^3$, set by the United States Army Corps of Engineers (USACE), all of which were recorded prior to 6/2/93; personnel were outfitted in Level C PPE and were therefore adequately protected for the lead levels registered. There were no recorded cases of personnel overexposure to ambient lead levels.

2.2 CONCLUSIONS

2.2.1 The SSHP was effectively implemented to address the health and safety hazards associated with each phase of site operations, and to meet the requirements set forth in 29 CFR 1910.120.

2.2.3 OHM Health and Safety Department concludes that the existing location-specific safety and health plan (SSHP) is appropriate for future phases of work at this site involving the same work activities.

2.2.3 Future work should be performed in Level D PPE with appropriate air monitoring to verify the selection of PPE. An action level of 30 $\mu g/m^3$ should be used to warrant controls. Once monitoring shows consistent readings below the action level, the amount and frequency of air monitoring shall be appropriately limited/reduced.

2.2.4 Special attention should be paid to prevent any recordable accidents and near misses during the course of future work. Routine tasks should be reviewed and evaluated for potential hazards. Daily safety meetings should be implemented to prevent injuries on-site.

3.0 SITE SAFETY AND HEALTH PLAN EVALUATION

3.1 A location-specific safety and health plan was issued before the start of this project to address the health and safety hazards associated with each phase of site operations; the plan met the requirements of 29 CFR 1910.120.

3.2 The phases of work addressed in the SSHP include the following:

Mobilization
Installation of perimeter fence
Bag and stockpile non-hazardous material*
Soil sampling
Excavation of contaminated soil
Load-out of contaminated soil
Backfill of excavation
Restoration of disturbed areas
Decontamination and demobilization

3.3 *Once on site, waste materials were designated to be direct loaded into dump trucks instead of being bagged.

3.4 Provisions were made to address heavy equipment, excavation and other physical hazards. Hazards associated with vehicle and pedestrian traffic in the work areas near roadways were controlled by the use of warning signs, men at work signs, and road guards to direct traffic. Personal protective equipment provisions were made to minimize exposure to lead contamination for personnel on-site, as well as to limit off-site emissions.

3.5 The minimum of Level C personal protection was required at the start of work on this project, to include the following:

Full-face air purifying respirator with GMC-H cartridges
Hard had
Polycoated Tyvek coveralls
Steel toed boots
Nylon booties (inner)
Robar/Tingley boots (outer)
Vinyl sample gloves (inner)
Cloth, leather, or PVC gloves (outer)

3.6 An amendment was made to the SSHP for downgrading the level of personal protective equipment (PPE) from Level C to Level D for personnel working in the exclusion zone. This amendment was issued based on air monitoring data analysis showing non-detectable levels or levels of ambient lead contamination consistently below the action level for samples taken in the excavation areas. The amendment was issued by the site safety officer, under the direction of the Regional Health and Safety Manager, who is certified by the American Board of Industrial Hygiene. The amendment was approved June 2, 1993 by USACE Representative, Chuck Malin. Refer to Exhibit I for a copy of the amendment.

3.7 The downgrade of PPE made provisions for personnel to wear Level D PPE during site activities, to include the following protective equipment:

Hard hat
Safety glasses
Steel toed leather safety shoes/boots
Polycoated Tyvek coveralls
Nylon booties (under) and Robars/Tingleys (outer)
Inner sample gloves - outer cloth or leather gloves

3.8 An action level of 15.0 $\mu g/m^3$ of airborne lead, as determined by integrated sampling, was set by USACE to upgrade the level of PPE to Level C, including use of an air purifying respirator. Air monitoring was performed for the duration of remedial activities to ensure proper PPE use.

4.0 SITE SAFETY

4.1 Accidents

Employee safety during work on this project was OHM's first priority. During the course of this project, one OSHA recordable accident occurred, involving a cut to an employee's knuckle and finger while he was working on a metal fence post. The employee received stitches and was able to return to work without recording any lost work time. The accident was investigated and the potential hazard was brought to the attention of site personnel during a morning safety meeting the following day. The employees were instructed to use protective leather/cut resistant work gloves during activities involving sharp surfaces and tools and to protect sharp or dangerous work surfaces as feasible.

4.2 Preventive Measures

4.2.1 A number of measures were taken on-site to prevent accidents and injuries. Daily safety meetings were held to discuss hazards associated with upcoming work tasks, the use of specific tools and equipment, and other chemical, physical and environmental hazards associated with site work. Task specific hazard evaluations were performed each day at each work site prior to the start of work.

Controls were used to eliminate the hazards associated with vehicle and pedestrian traffic near the work locations. Warning signs were posted and guards were used to direct traffic.

4.2.2 A heat stress prevention program was instituted on-site. Personnel heat stress monitoring was performed to control the onset of heat related illnesses during work in high ambient temperatures. Employees' body weights were recorded at the start of the work shift and were rechecked at the end of the shift to determine any change in body weight potentially due to fluid loss.

4.2.3 Site workers' pulse, body temperature, and blood pressure were taken before and after each break. Work-rest schedules were determined by the results of this monitoring in accordance with the SSHP heat stress monitoring criteria.

4.2.4 Specific work-rest regimens were established at the start of every work day, based on the specific work conditions for that day (temperature, time of day, amount of sun or shade, etc.) Breaks were taken as designated throughout the work shift in shady areas, with personal protective equipment removed, cool liquids (juice, water) provided. Visual observation by a designated safety official was used to identify individuals exhibiting symptoms of heat related illness and to take the necessary action.

5.0 EXPOSURE MONITORING

Work for the Granite City project involved excavation of lead contaminated soil and battery casings at various sites throughout Granite City, Madison, and Venice, Illinois. The potential for exposure to these contaminants existed through dust migration in the air and personnel and equipment tracking.

5.1 Methodology

Air monitoring was performed to determine the ambient levels of total suspended particulates generated during excavation, and to determine total ambient lead exposure for site personnel and perimeter emissions. Wind direction at the start of each work day was used to determine the placement of sampling instruments on-site. Refer to Exhibit II for the air monitoring protocol used during site operations.

5.1.1 Direct Reading

Direct reading aerosol monitors (MINIRAM Aerosol Monitor, Model PDM-3 or equivalent) were used to determine levels of total suspended particulates (dust) at each excavation site.

The MINIRAM operates based on the detection of scattered electromagnetic radiation (light.) The MINIRAM requires no pump for its operation, and is designed to respond to particle sizes in the range of 0.1 to 10 μm (micrometers) It displays its results as mg/m^3, and the measurement ranges are 0.01 to 10 mg/m^3 and 0.1 to 100 mg/m^3, $\pm$ 0.02 mg/m^3 (1 minute averaging.) MINIRAMS were zeroed daily before each reading (approximately every 30 minutes) to ensure effective measurements.

MINIRAMS were used on-site to supplement visual observation in providing effective dust control. Three samples were taken approximately every 30 minutes during site operation; one sample was taken upwind of excavation operations and two were taken downwind. Results were recorded in a logbook kept on-site.

5.1.2 Integrated Sampling

Personnel and perimeter samples were taken to determine the levels of total lead in the air in the personal breathing zone and at the site perimeter. Lead samples were collected and analyzed using NIOSH method 7082, using battery

operated air sampling pumps (Gillian or equivalent) fitted with 37 mm mixed cellulose ester (MCE) filters, 0.8 micron pore diameter.

5.1.2.1 Perimeter Sampling

Three perimeter samples were taken daily over the course of the work shift. One sample was taken upwind of site operations and two were taken downwind. Perimeter samples were taken above ground level (approximately 4-5 feet in height) to characterize the breathing zone and to prevent contamination due to foot traffic. The pump flowrate was calibrated and set at about 10 liters per minute for the duration of the task (approximately 8 hours.)

Pumps were calibrated using a secondary standard, a rotameter, to determine the sample flowrate. Calibration readings and sample results were documented in project logbooks kept on-site. Analytical and calibration data are available in the OHM Findlay,Ohio office. Refer to Exhibit III for samples of this data.

5.1.2.2 Personnel Sampling

Personnel air samples for lead were taken for a representative number of employees performing intrusive activities within the exclusion zone (one employee from each job category - at least two employees per day.) The samples were taken in the person's breathing zone for the duration of the shift worked on that day.

Samples were collected at the end of the work day and sent to the analytical lab for analysis for total lead. A blank sample was included in the shipment.

Samples were assigned identification numbers based on an established code. Refer to Exhibit II, section 4.3, for a copy of the code.

The analytical laboratory used was Chemtex, 3082 25th Street, Port Arthur, Texas. Standard turnaround for sample results was 24 hours by facsimile; original data was mailed.

Direct reading (MINIRAM) and integrated (perimeter) samples were taken in approximately the same locations (within 3 feet) at the work sites. Maps depicting a typical air monitoring set-up for each excavation site are presented in Exhibit IV of this report, detailing the location of real-time monitors and perimeter pumps.

5.1.3 Medical Monitoring

Personnel blood lead levels were determined prior to and after the completion of work for this project. Monitoring was performed in accordance with the requirements of 29 CFR 1910.1025 for personnel working in contaminated areas.

5.2 Action Levels

Action levels were determined for use with the MINIRAM by taking a predetermined average, provided by USACE, and adding it to the background reading taken at the start of the work shift.

The action level was used to determine when dust control measures should be implemented. If the action level was exceeded during the course of work, and was believed to be caused by site activities (i.e. downwind of excavation), operations would cease and wet spray control measures would be implemented to reduce/eliminate dust emissions. Work in the work zone resumed once visible emissions were controlled and readings dropped to below the action level.

During lead excavation operations for this project, the specified action levels for the MINIRAM and personnel monitoring were exceeded 26 and 4 times respectively, primarily at the Missouri Avenue site. The majority of these readings were results of upwind samples, attributed to area vehicle traffic rather than site operations.

5.3 Sample Results

5.3.1 MINIRAM Monitoring

Readings were taken daily on-site, approximately every 30 minutes, using the MINIRAM; one upwind and two downwind of excavation/intrusive activities.

The total dust levels detected by the MINIRAM over the course of this project ranged from Non-detectable (ND < 0.01 mg/m^3) which reads 0.00 on the monitor, to about 4.0 mg/m^3 of total dust. The majority of these readings did not exceed their location specific action levels, and did not exceed the ACGIH TLV of 10 mg/m^3. The readings were used in conjunction with visible dust levels to indicate when dust control measures were needed (wet spray.)

The following is a listing of some of the instances in which the action levels for total dust were exceeded and the surrounding circumstances:

Table 5.3-1
MINIRAM READINGS ABOVE THE ACTION LEVEL (AL)

NUMBER > AL (mg/m^3)	AL (mg/m^3)	LOCATION	DATE	OPERATIONS PERFORMED
1 @ .23 1 @ .21	0.17	Missouri Av (downwind)	4/15/93	Loading truck, excavating
1 @ .18 1 @ .23 1 @ .15	0.14	Missouri Av (upwind)	4/16/93	Excavating, loading, clearing fence line
3 @1.46 8 @ 2.09 3 @2.10	0.25	Missouri Av (upwind)	4/21/93	Excavating, loading trucks
1 @ 2.5	2.49	Missouri Av (upwind)	4/28/93	Soil loadout
1 @ 2.54	2.53	Missouri Av (upwind)	4/29/93	Excavating
2 @ 2.53 2 @ 2.63 1 @ 2.83	2.51	Missouri Av (upwind)	5/6/93	Excavating

The upwind total dust levels detected by the MINIRAM were higher than the downwind levels consistently over the course of work on this project.

5.3.2 Personnel Monitoring

Personnel performing intrusive activities such as operating or spotting an excavator, stockpiling operations, hand excavating, loading soils, etc. were sampled for total airborne lead exposure. Samples were taken in the individual's breathing zone, using Gillian sampling pumps equipped with 37 mm cassettes. NIOSH method 7082 was used for sampling and analysis.

The majority of samples analyzed showed non-detectable levels* of lead. Detectable lead levels were found under the following circumstances as listed:

Table 5.3-1
PERSONNEL LEAD MONITORING RESULTS

DATE	LEVEL (mg/m^3)	LOCATION	ACTIVITY
4/23/93	0.00021	Missouri Ave	Guiding/lining trucks
4/27/93	0.4120	Missouri Ave	Guiding/lining trucks; hand excavating
5/13/93	0.0510	Missouri Ave	Hand excavating
5/17/93	0.1320	Terry St	Spotting, placing bows on trucks
5/18/93	0.009	Hill	Hand excavating
	0.0610	Hill	Hand excavating
	0.0020	Harrison	Spotter
5/19/93	0.0100	Harrison	Spotter, erecting bows
6/7/93	0.0021	Terry St	Hand excavating
6/18/93	0.0056	Cleveland	Hand excavating; spotter
6/25/93	0.0021	Delmar	Truck loading
6/29/93	0.0015	Terry St	Excavator operator
6/30/93	0.0014	Cleveland	Operator

*Non-detectable levels ranged from <0.0002 to <0.0025 mg/m^3

Until the addendum to the HASP was made (6/2/93), site personnel working in the exclusion zone wore MSA full face air purifying respirators with GMC-H cartridges at all times.

As is evident in the personnel monitoring data, the highest detectable level of lead was 0.4120 mg/m^3 8-hour TWA. This individual as well as the majority of

personnel with detectable exposure levels of lead over the AL were performing very close, intrusive operations such as hand excavating lead contaminated soils. Other personnel were spotting excavator operations, which put them in close proximity to the dusts generated during excavation. As all of these readings (>AL) were logged before 6/2/93, personnel were outfitted in Level C PPE including an air purifying respirator at all times during the course of work. There were no readings over the action level after 6/2/93, and therefore the level of protection (Level D) was appropriate for work being performed.

5.3.3 Perimeter Monitoring

Perimeter sampling for lead levels emanating from the site was conducted using the same sampling and analytical method as the personnel sampling; however the pumps were mounted and positioned around the perimeter of the site (1 upwind and 2 downwind), in approximately the same locations as the MINIRAMS.

Perimeter sample results indicated predominantly non-detectable lead levels*. The following list presents detectable lead levels and the surrounding circumstances:

Table 5.3-2
PERIMETER MONITORING RESULTS

DATE	LOCATION	READING (mg/m^3)	ACTIVITY
5/17/93	Terry	0.0005 (upwind)	Stocking and loading trucks
		0.0017 (downwind)	Stocking and loading trucks
6/4/93	Weber	0.00095 (upwind)	Loading trucks
6/7/93	Terry	0.00195 (upwind)	Excavating
6/9/93	Missouri Av	0.0038 (upwind)	Loading trucks
6/15/93	Colgate	0.0006 (upwind)	Excavating
6/16/93	Cleveland	0.0022 (upwind)	Excavating
6/23/93	Delmar	0.0004 (upwind)	Excavating
6/28/93	Delmar	0.0009 (upwind)	Excavating
6/29/93	Terry	0.0009 (upwind)	Excavating

* Non-detectable levels ranged from <0.00025 to <0.002 mg/m^3

EXHIBIT I
AMENDMENT TO SITE SAFETY AND HEALTH PLAN

AMMENDMENT TO SAFETY AND HEALTH PLAN

RAPID RESPONSE LEAD CONTAMINATION REMEDIATION

The following changes will be made in the levels of protection to be worn during excavation and load-out of contaminated soil operations as written in section 6.3 Task Specific Protection Level of the Site Safety Plan.

Modified Level D will be permitted during excavating/loading activities in the exclusion zone due to our successful use of engineering controls (wetting techniques) and the supporting analytical results of non-detectable lead in air concentrations obtained through personal and perimeter air monitoring.

Modified Level D will be as follows:

Hard Hat
Safety Glasses
Steel Toed Leather Safety Shoes or Boots
Polycoated Tyvek
Nylon Booties (inner) - Robars or Tingles (outer)
Inner Sample Gloves - Outer Cloth or Leather Gloves

Chuck Malin of the USACE has reviewed the supporting analytical data and the conditions on which the downgrade has been set. Downgrade was approved June 2, 1993 at 1430 by USACE Representative, Chuck Malin.

EXHIBIT II
AIR MONITORING PROTOCOL

PROTOCOL FOR AIR MONITORING
RAPID RESPONSE LEAD CONTAMINATION REMEDIATION

1 Purpose

1.1 The purpose of this protocol is to document the methods used to perform air monitoring at the Lead Remediation Project in Granite City, Illinois.

1.2 The monitoring is intended to meet the requirements of the OSHA standard for personnel exposure to lead, 29 CFR 1910.1025.

2 Scope

2.1 Air monitoring for total airborne dust is performed using a direct reading instrument, equivalent to MIE Miniram Aerosol Monitor, Model PDM-3.

2.2 Monitoring for airborne lead in the personnel breathing zone is performed using a battery operated sampling pump worn during the workshift.

2.3 Monitoring for airborne lead at the perimeter of the exclusion zone is performed using an electrically powered pump, operated for the duration of the work during the day.

3 Operating Protocol

3.1 Direct Reading Instruments

3.1.1 Each instrument is designed to measure total dust. An action level has been established for each individual project site.

3.1.1.1 The action levels are documented in section 9.7 of the Safety and Health Plan.

3.1.1.2 The allowable concentration for a particular site was established according to the concentration of lead found in the soil at the site.

3.1.2 Direct reading instruments are placed on a tripod and located at the perimeter of the exclusion zone.

3.1.3 Two monitors are located downwind, one instrument is located upwind.

3.1.4 Instruments are calibrated by the factory, at least every twelve months.

3.2 Personnel Air Samples

3.2.1 Air samples are collected to measure total lead in the personnel breathing zone. The procedures for collection and analysis are equivalent to the procedure, NIOSH 7082.

3.2.2 A mixed cellulose ester filter, 0.8 micron pore diameter, is used to collect the sample. The pump flowrate is calibrated and is set at 2 liters per minute (L/min).

3.2.3 The pump is operated for the duration of the task and terminated at the end of the shift.

3.2.4 The pump is attached to the technician with the filter cassette located in the breathing zone. The pump is placed inside the disposable coveralls.

3.2.5 At least two samples are collected each day for two different people.

3.2.6 The air flowrate is measured using a primary calibration standard, equivalent to a Gillian Gillabrator. The flowrate, measured in the afternoon, is recorded on a log sheet and is used as the beginning flowrate for the next day. The battery for the pump is charged overnight.

3.3 Perimeter Air Samples

3.3.1 Air samples are collected to measure total lead at the perimeter of the exclusion zone. The procedures for sample analysis are equivalent to the procedure, NIOSH 7082.

3.3.2 A mixed cellulose ester filter, 0.8 micron pore diameter, is used to collect the sample. The pump flowrate is calibrated and is set at approximately 10 liters per minute (L/min).

3.3.3 The pump is operated for the duration of the task and terminated at the end of the shift.

3.3.4 The filter cassette is attached to a tripod at approximately 5 feet from the ground and located at the perimeter of the exclusion zone.

3.3.5 Two monitors are located downwind, one instrument is located upwind, near the direct reading instruments.

3.3.6 Instruments are calibrated by the factory, at least every twelve months.

3.3.7 The air flowrate is measured using a secondary calibration standard. Specifically, the rotameter is used to estimate the sample flowrate. The flowrate is measured in the afternoon is recorded on a log sheet and is used as the beginning flowrate for the next day. The battery for the pump is charged overnight.

4 Sample Analysis

4.1 The samples are retrieved at the end of the day and sent to the analytical lab for analysis of total lead. A blank is included in the shipment.

4.2 Results for samples are listed in a project logbook. The activities performed during the day are listed in the sampling log book.

4.3 The sample number is selected using the following code:

- XXX or PER — Abbreviation for the site or. for a personnel sample.
- 00 — Sequential sample number for the day of collection.
- XX — Abbreviation for person who collected the sample or the initials of the person who wore the personnel pump.
- 000 — Sequential Workday number or the month and day when the sample was collected.

4.3.1 The sample number for an area sample collected on April 14, 1993 at the Missouri Avenue site by Mark Proctor is MISO1MP01.

4.3.2 The sample number for a personnel sample collected on April 14, 1993 for John Hester is PER01JH414.

EXHIBIT III
SAMPLES OF ANALYTICAL AND LOGGED DATA

MINIRAM LOG

BG 2.90
PDL .93
AL 3.83

6-9-93 Sunny Winds Temp 82° Hum 72%
0545 Command Post prepare for today
0600 Safety meeting M Sackman general
0630 ABBOTT St set up zone, set pumps
M Daniel FM
R Theis OP Gilian pump 9636 0730
J Kennedy RT
R Sussi RT
R Dandridge RT
J Beahley RT
R Freels RT
0645 2 special waste trucks loaded out of Weber. Air horn tested & heard by crew.
0730 Crew on ABBOTT ST Bellman on site
0800 1st truck being loaded out of ABBOTT J Beahley, J Kennedy Weber 6" backfill gravel compacting. Concrete sub contractor starting to set forms on Weber West

Mini Ram S/N	High Vol Pumps S/N
#1 5357	#1 3296
#2 5428	#2 3295
#3 4378	#3 2534

8900 Crew out of Zone
0945 Crew load Bellam 1st 2 trucks light. Cuningham 2 trucks on site Weber, Abbott for special waste.

Mayor of Venice on site.

1215 M Panel load two speed west Cunningham trucks Webber west.

1300 Lunch

1345 Water truck watering down ABBOTT St. East Weber West concrete crew pouring slab.

1605 OFF site

1715 END OF DAY

M.M. Ram ABBOTT St 6/9/93

0800 1 2.90	1030 1 2.91	1300 1 2.92	1530 1 2.85
2 1.88	2 1.86	2 1.85	2 1.88
3 .18	3 .19	3 .15	3 .15
0830 1 2.90	1100 1 2.90	1330 1 2.91	1600 1 2.85
2 1.86	2 1.85	2 1.86	2 1.88
3 .18	3 .17	3 .15	3 .19
0900 1 2.91	1130 1 2.90	1400 1 2.92	
2 1.86	2 1.84	2 1.85	
3 .19	3 .15	3 .15	
0930 1 2.91	1200 1 2.89	1430 1 2.92	
2 1.87	2 1.82	2 1.86	
3 .18	3 .16	3 .16	
1000 1 2.92	1230 1 2.85	1500 1 2.91	
2 1.86	2 1.80	2 1.86	
3 .19	3 .15	3 .16	

OHM

DIRECT READING INSTRUMENT LOG

Project: U.S Army Corps of Engineers Job No.: 13407

Date: 6/23/93 Operator: J. Delhomme

Instrument: Miniram Calibration: _____ (Amt, Component, Date)

Sampling Technique: #1 = Upwind #2 & 3 = Downwind

208 Terry st

Sample Interval: 30 min

Background Reading: .90 mg/m³ Predetermined Avg = .09 mg/m³

Action Level/Response: .99 mg/m³

Time	Location	Reading (units)			Detection Limit (Scale)
0730	208 Terry St	#1 = .50	#2 = .00	#3 = .00	
0800	"	#1 = .55	#2 = .00	#3 = .00	
0830	"	#1 = .61	#2 = .00	#3 = .00	
0900	"	#1 = .63	#2 = .00	#3 = .00	
0930	"	#1 = .57	#2 = .00	#3 = .00	
1000	"	#1 = .58	#2 = .00	#3 = .00	
1030	"	#1 = .51	#2 = .00	#3 = .00	
1130	"	#1 = .55	#2 = .00	#3 = .00	
1200	"	#1 = .54	#2 = .00	#3 = .00	
1230	"	#1 = .62	#2 = .00	#3 = .00	
1300	"	#1 = .60	#2 = .00	#3 = .00	
1330	"	#1 = .59	#2 = .00	#3 = .00	
1400	"	#1 = .57	#2 = .00	#3 = .00	
1430	"	#1 = .57	#2 = .00	#3 = .00	
1500	"	#1 = .50	#2 = .00	#3 = .00	
	(15) $\bar{x}$ =	.56	.00	.00	

OHM Corporation

PERSONAL SAMPLING DATA SHEET

PROJECT # 13407

DATE: APRIL 15 1993

PERFORMED BY: MARK S. PROCTOR

DAY: THURSDAY

TITLE: Health + Safety

				37mm CSTS,	FLOW RATE (L/MIN)			TIME		
SAMPLE NO.	NAME	TASK PERFORMED	ANALYSIS METHOD	SAMPLING MEDIA	PRE	POST	TOTAL VOL.(L)	START	STOP	TOTAL TIME(MIN)
PER 05 JW 415	John Wysock #5371	Lining trucks w/ vidqueen	Lead	Pump #9636	2.00l/m	2.00l/m	960	0900	1700	480 min
PER 06 JH 415	John Hester #1834	Operating Excavator	Lead	Pump #6071	2.00l/m	2.00l/m	960	0900	1700	480 min
	Did NOT	USE TODAY		Pump #9892	2.00l/m	2.00l/m				
PER 07 BS 415	—	—	Lead	Blank	—	—	—	—	—	—

REMARKS:

OHM Corporation

PERSONAL SAMPLING DATA SHEET

PROJECT # 13407

DATE: APRIL 14, 1993

PERFORMED BY: MARK S. PROCTOR

DAY: WEDNESDAY

TITLE: HEALTH & SAFETY

				37mm MCE	FLOW RATE (L/MIN)			TIME		
SAMPLE NO.	NAME	TASK PERFORMED	ANALYSIS METHOD	SAMPLING MEDIA	PRE	POST	TOTAL VOL.(L)	START	STOP	TOTAL TIME(MIN)
PER02 KF 414	K. FOGGY #5471	DIGGING WITH SHOVEL LOCATING UTILITY LINES	LEAD	Pump# 6071	2.02 l/m	2.00 l/m	960 (L) TOT. VOL.	0900	1700	480 MIN
PER03 JW 414	J. WYSOCK #5371	DIGGING WITH SHOVEL LOCATING UTILITY LINES	LEAD	Pump# 8749	2.01 l/m	2.00 l/m	960 (L) TOT. VOL.	0900	1700	480 MIN
				Pump# 9890	2.01 l/m					
PER01 JH 414	J. HESTER #1834	OPERATING EXCAVATOR	LEAD	Pump# 7171	2.04 l/m	2.04 l/m	600 (L) TOT. VOL	1230	1730	300 MIN
				Pump# 9892	2.00 l/m					
				Pump# 11021	2.04 l/m					
				Pump# 4424	2.05 l/m					
PER04 BS 414	—	—	LEAD	BLANK	—	—	—	—	—	—

REMARKS:

April 22, 1993

Sample No.: PER 24 JH 422
Location: Missouri Ave
Employee: John Hester
Activity: Excavating & Moving Soils / CAT 215
Exposure Time: 540 min
Sample Results: < 0.00020 mg/m³
Report Date: 4/26/93
Performed By: Chemtex Lab 304/601

Sample No.: PER 25 DK 422
Location: Missouri Ave.
Employee: Dwight Kilgore
Activity: Guiding And Lining Trucks
Exposure Time: 540 min
Sample Results: 0.00021 mg/m³
Report Date: 4/26/93
Performed By: Chemtex Lab 304/602

Sample No.: PER 26 BS 422
Location: Missouri Ave.
Employee: "Blank Sample"
Activity: N/A
Exposure Time: N/A
Sample Results: < 0.00125 mg/m³
Report Date: 4/26/93
Performed By: Chemtex Lab 304/603

Note: At all times while employees were in the exclusion zone, MSA full face respirators with GMC-H cartridges were worn. Samples were collected in the breathing zone.

APRIL 23, 1993

SAMPLE No.: PER 27 JH 423
LOCATION: MISSOURI AVE.
EMPLOYEE: JOHN HESTER
ACTIVITY: EXCAVATING ; MOVING SOILS / CAT 215
EXPOSURE TIME: 480 MIN.
SAMPLE RESULTS: < 0.00020 mg/m^3
REPORT DATE: 4/26/93
PERFORMED BY: CHEMTEX 3041608

SAMPLE No.: PER 28 DK 423
LOCATION: MISSOURI AVE.
EMPLOYEE: DWIGHT KILGORE
ACTIVITY: GUIDING AND LINING TRUCKS, HAND EXCAVATING
EXPOSURE TIME: 480 MIN
SAMPLE RESULTS: < 0.00020 mg/m^3
REPORT DATE: 4/26/93
PERFORMED BY: CHEMTEX LAB 3041609

SAMPLE No.: PER 29 BS 423
LOCATION: MISSOURI AVE
EMPLOYEE: "BLANK SAMPLE"
ACTIVITY: N/A
EXPOSURE TIME: N/A
SAMPLE RESULTS: < 0.00125 mg/m^3
REPORT DATE: 4/26/93
PERFORMED BY: CHEMTEX LAB 3041610

NOTE: AT ALL TIMES WHILE EMPLOYEES WERE IN THE EXCLUSION ZONE, MSA FULL FACE RESPIRATORS WITH GMC-H CARTRIDGES WERE WORN. SAMPLES WERE COLLECTED IN THE BREATHING ZONE.

May 8, 1993

SAMPLE No.: MIS01JD17
LOCATION: Missouri Ave (UPWIND)
ACTIVITY: EXCAVATING, STOCKING, & LOADING SOILS
SAMPLE TIME: 390 min.
RESULTS: < 0.00075 mg/m³
REPORT DATE: 5/11/93
PERFORMED BY: CHEMTEX LAB 3050570

SAMPLE No.: MIS02JD17
LOCATION: MISSOURI AVE (DOWN WIND)
ACTIVITY: EXCAVATING, STOCKING, & LOADING SOILS.
SAMPLE TIME: 390 min.
RESULTS: < 0.00075 mg/m³
REPORT DATE: 5/11/93
PERFORMED BY: CHEMTEX LAB 3050571

SAMPLE No.: MIS03JD17
LOCATION: MISSOURI AVE (DOWN WIND)
ACTIVITY: EXCAVATING, STOCKING, & LOADING SOILS
SAMPLE TIME: 390 min.
RESULTS: < 0.00075 mg/m³
REPORT DATE: 5/11/93
PERFORMED BY: CHEMTEX LAB 3050572

SAMPLE No.: MIS04 BC17
LOCATION: MISSOURI AVE. ("BLANK SAMALE")
RESULTS: < 0.00125 mg/m³
REPORT DATE: 5/11/93
PERFORMED BY: CHEMTEX LAB 3050573
NOTE: WIND: EAST TEMP.: HI 85°F LOW 67°F
HUM: 62% SUNNY CLEAR

May 7, 1993

SAMPLE NO.: MIS 01 JD 16
LOCATION: MISSOURI AVE (UPWIND)
ACTIVITY: EXCAVATING, STOCKING, & LOADING SOILS.
SAMPLE TIME: 240 MIN.
RESULTS: < 0.00050 mg/m^3
REPORT DATE: 5/11/93
PERFORMED BY: CHEMTEX LAB 3050565

SAMPLE NO.: MIS02 JD16
LOCATION: MISSOURI AVE. (DOWN WIND)
ACTIVITY: EXCAVATING, STOCKING, & LOADING SOILS.
SAMPLE TIME: 240 MIN.
RESULTS: < 0.00050 mg/m^3
REPORT DATE: 5/11/93
PERFORMED BY: CHEMTEX LAB 3050566

SAMPLE NO.: MIS03 JD16
LOCATION: MISSOURI AVE. (DOWN WIND)
ACTIVITY: EXCAVATIN, STOCKING, & LOADING SOILS
SAMPLE TIME: 240 MIN.
RESULTS: < 0.00050 mg/m^3
REPORT DATE: 5/11/93
PERFORMED BY: CHEMTEX LAB 3050567

SAMPLE NO.: MIS04 JD16
LOCATION: MISSOURI AVE. ("BLANK SAMPLE")
RESULTS: < 0.00125 mg/m^3
REPORT DATE: 5/11/93
PERFORMED BY: CHEMTEX LAB 3050568
NOTE: WIND: SOUTHEAST TEMP.: HI 85°F LOW 65°F
HUM. 69% SUNNY CLEAR

CHEMTEX

Environmental & Industrial Hygiene Services

3082 25th Street Port Arthur Texas 77642 409-983-4515
FAX 409-982-1602

Client: O H M Corporation
370 Old Rock Rd.
Granite City, IL 62040

Attn: Mr. Mark Sackman

Report Date: 6/17/93
Sample Source: Filters
Date Collected: 6/16/93
Collected By: Client
Date Received: 6/17/93
CHEMTEX FILE #: 3061312

PROJECT: 13407, U.S. ARMY CORP OF ENGINEERS, GRANITE CITY, ILLINOIS

RESULTS OF ANALYSIS

CHEMTEX #	Sample Identification	Lead (mg/m^3)
3061312	CLG01MS02	< 0.00035
3061313	CLG02MS02	< 0.00035
3061314	CLG03MS02	< 0.00035
3061315	CLG04MS02	< 0.00125 mg/Filter
3061316	PER136RT616	< 0.0020
3061317	PER138BS616	< 0.00125 mg/Filter
Date Analyzed/ Analyst		6/17/93 KR/DT

Analyzed by NIOSH Method 7082.

C N Reddy

Dr. C. N. Reddy, Ph.D
Director

CMM/CNR

OHM Corporation

AIN-OF-CUSTODY RECORI

Form 0019
Field Technical Services
Rev. 08/89

No. 94460

O.H. MATERIALS CORP. • P.O. BOX 551 • FINDLAY, OH 45839-0551 • 419-423-3526

PROJECT NAME	PROJECT LOCATION
U.S. Army Corps of Engineers	Granite City, IL

PROJ. NO.	PROJECT CONTACT	PROJECT TELEPHONE NO.
13407	Mark Sackman	

CLIENT'S REPRESENTATIVE	PROJECT MANAGER/SUPERVISOR
Chuck McCaw	Dave Strickland

ITEM NO	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)	NUMBER OF CONTAINERS	ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS) LEAD	REMARKS
1	CL6-01mS03	6/16/93	340 PM			Flow NE Vol 3600L Collect Excavation - Load NE	1	X	30001312
2	CL6-02mS04	"	"			Flow NE Vol 3600L Collect - Excavation - Load NE	1	X	30001313
3	CL6-03mS02					Flow NE Vol 3600 L Collect Excavation - Load NE	1	X	30001314
4	CL6-04mS03					BLANK	1	X	30001315
5	PCA136KT Mix		340 PM			Flow 2L Vol 720L Bump Then - Allow - Operate	1	X	30001316
6	PCB138 BS1616	6/16/93				BLANK	1	X	30001317
7									
8									
9									
10									

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	6	Mark Sackman	[signature] for Chemtex	6/16/93	
2				6/17/93	1000
3					
4					

REMARKS

24 hr turn around - results in ng/m3
Fax to (618) - 876 - 8906. Then
follow with Hard Copy Data
mail to: OHM Corp
370 Old Rock Rd
Granite City, IL 62040

SAMPLER'S SIGNATURE

LAB COPY

CHEMTEX TEL:1-409-982-1522 J '1 409 982 1522 No.015 P. JUN 17 '93 05:56PM

CHEMTEX
Environmental & Industrial Hygiene Services

3082 25th Street Port Arthur Texas 77642 409-983-4675
FAX 409-983-1622

Client: O H M Corporation
370 Old Rock Rd.
Granite City, IL 62040

Attn: Mr. Mark Sackman

Report Date: 6/16/93
Sample Source: Filters
Date Collected: 6/15/93
Collected By: Client
Date Received: 6/16/93
CHEMTEX FILE #: 3061219

PROJECT: 13407, U.S. ARMY CORP OF ENGINEERS, GRANITE CITY, ILLINOIS

RESULTS OF ANALYSIS

CHEMTEX #	Sample Identification	Lead (mg/m^3)
3061219	CVR01JD01	< 0.00055
3061220	CVR02JD01	< 0.00055
3061221	CVR03JD01	< 0.00055
3061222	CVR04BS01	< 0.00125 mg/Filter-

Date Analyzed/ Analyst	6/16/93 KR/DT

Analyzed by NIOSH Method 7082.

CVReddy

Dr. C. N. Reddy, Ph.D
Director

JLP/CNR

OHM Corporation

CHAIN-OF-CUSTODY RECORD

Form 0019
Field Technical Services
Rev. 08/89

No. 94462

O.H. MATERIALS CORP. • P.O. BOX 551 • FINDLAY, OH 45839-0551 • 419-423-3526

PROJECT NAME	PROJECT LOCATION
U.S Army Corp. of Engineers	Granite City, IL
PROJ. NO. / PROJECT CONTACT	PROJECT TELEPHONE NO.
13407 / Mark Sackman	(618) 876-8553
CLIENT'S REPRESENTATIVE	PROJECT MANAGER/SUPERVISOR
Chuck Malin	Dave Strickland

ITEM NO.	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)	NUMBER OF CONTAINERS	ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)	REMARKS
1	CVR01J001	6/15/93	[illegible]	X		37mm cassette (up wind Carver st)	1	Lead	2400 L TOT VOL @ 10 L/m 306219
2	CVR02J001	6/15/93	[illegible]	X		37mm cassette (Down wind Carver st)	1	Lead	2400 L TOT VOL @ 10 L/m 306220
3	CVR03J001	6/15/93	[illegible]	X		37mm cassette (Down wind Carver st)	1	Lead	2400 L TOT VOL @ 10 L/m 306221
4	CVR04BS01	6/15/93	—	X		37 mm cassette (Carver st)	1	Lead	— 306222
5									
6									
7									
8									
9									
10									

CHEMTEX

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1		[signature]	[signature] 6/16/93 1030AM CHEMTEX	6/15/93	1700
2					
3					
4					

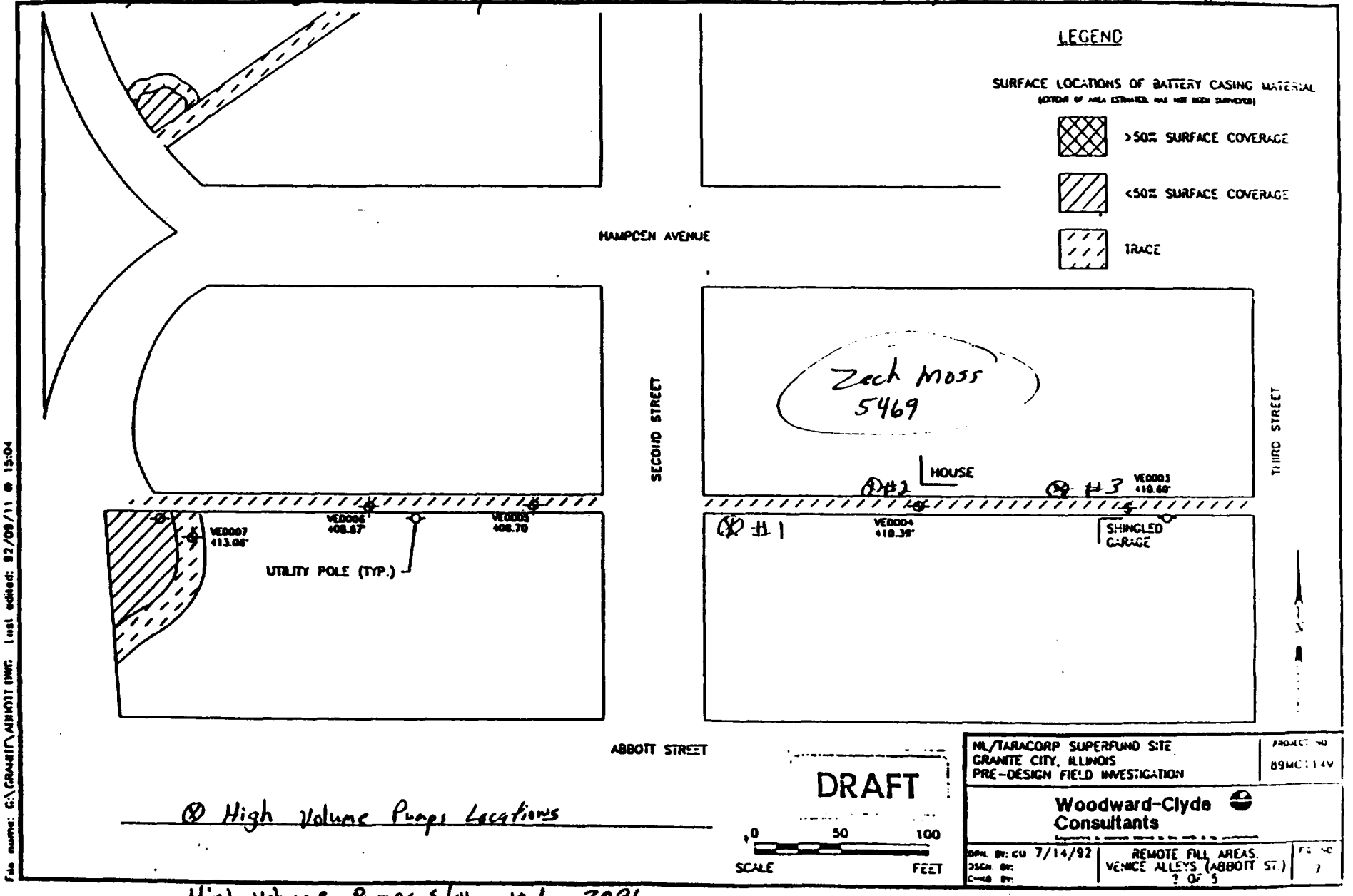
REMARKS 24 hr Turn around results in mg/m³ fax to (618) 876-8406. Then follow with reg. mail Hard Copy Data To: OHM Corp 370 Old Rock Rd Granite City, IL 62040

[signature] 4380
SAMPLER'S SIGNATURE

TEL:1-409-982-1522 J '1 409 982 1522 No.015 P. JUN 16 '93 04:39PM

EXHIBIT IV
LOCATION MAPS

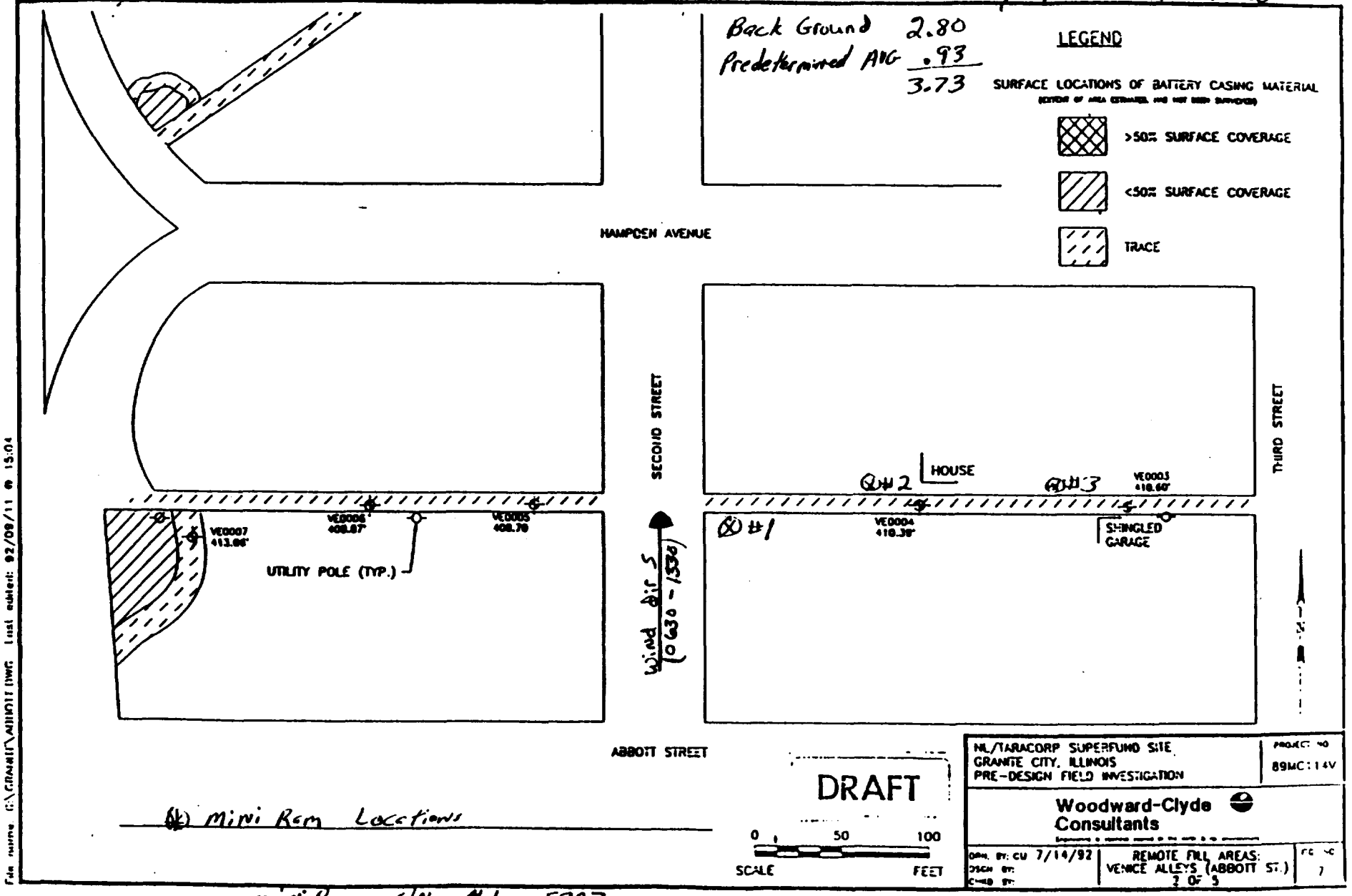
June 10, 1993 High Volume Pump Locations WIND S Temp 90° Hum 75%



⊗ High Volume Pumps Locations

High Volume Pumps S/N #1 3296
#2 3295

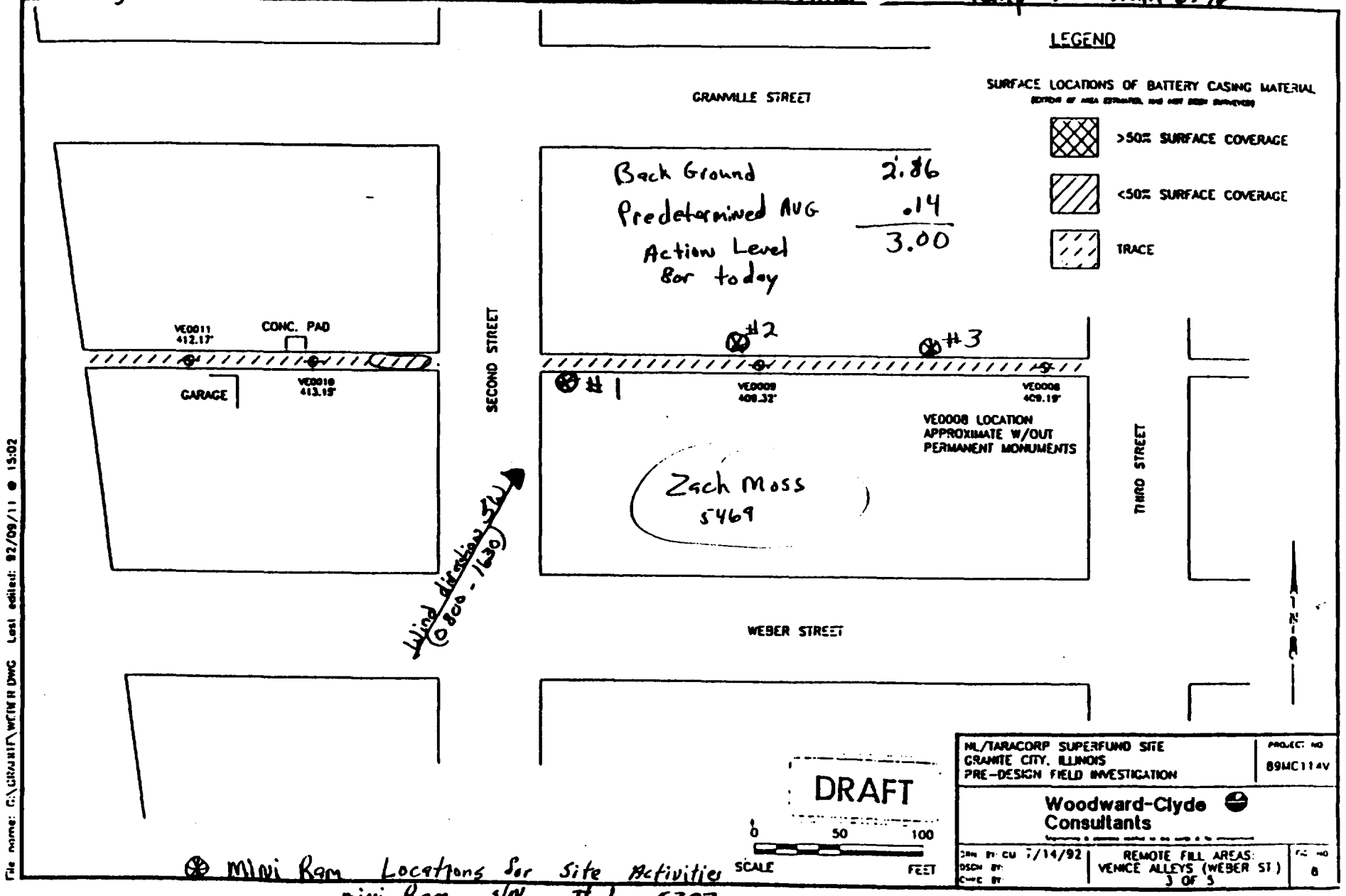
June 10, 1993 Mini Ram Locations for site Activities Wind S Temp 90° Hum 75%



(4) Mini Ram Locations

mini Ram S/N #1 5397
#2 5428

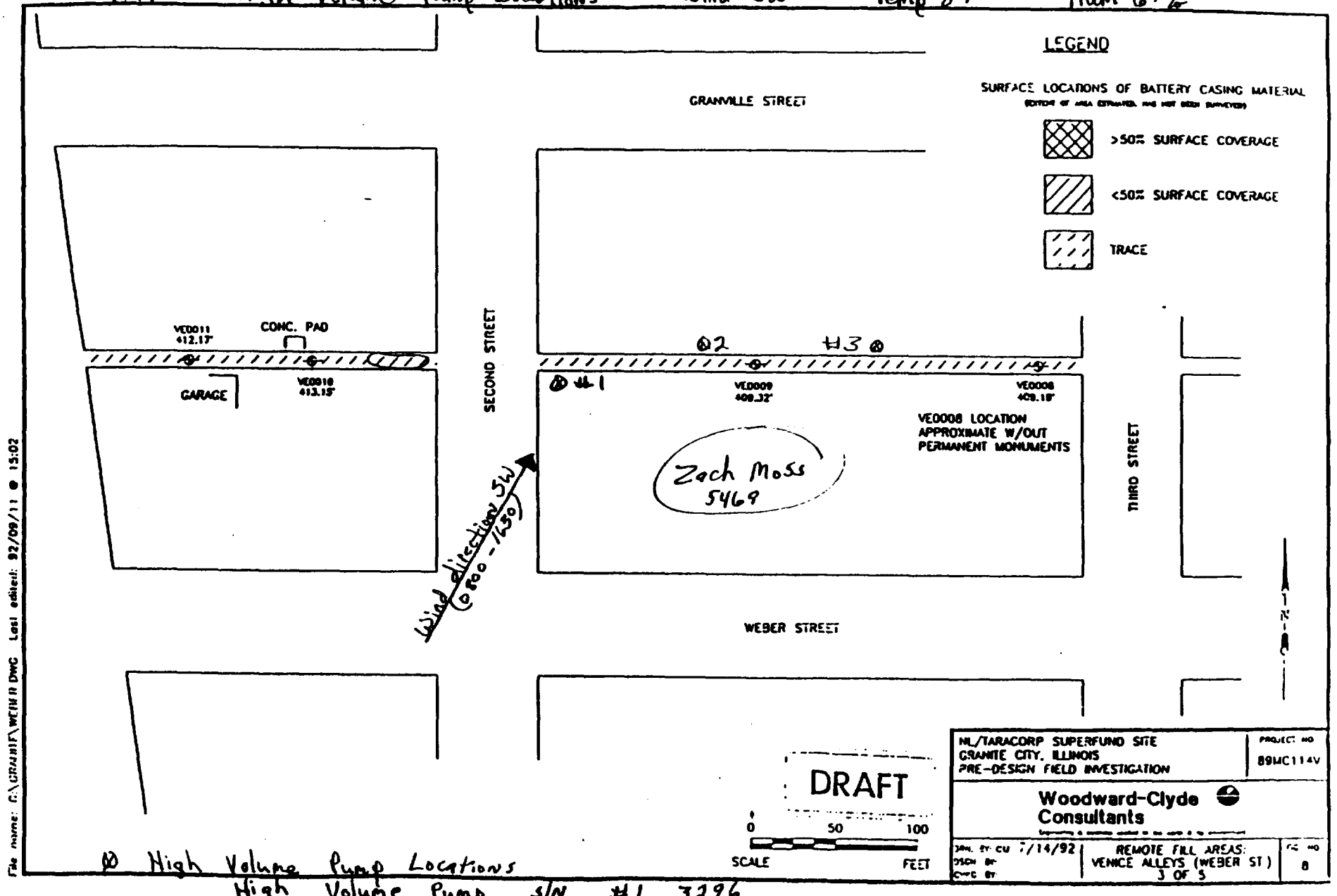
June 7th 1993 Mini Ram Locations for Site Activities Winds W Temp 89° Hum 67%



Mini Ram Locations for Site Activities

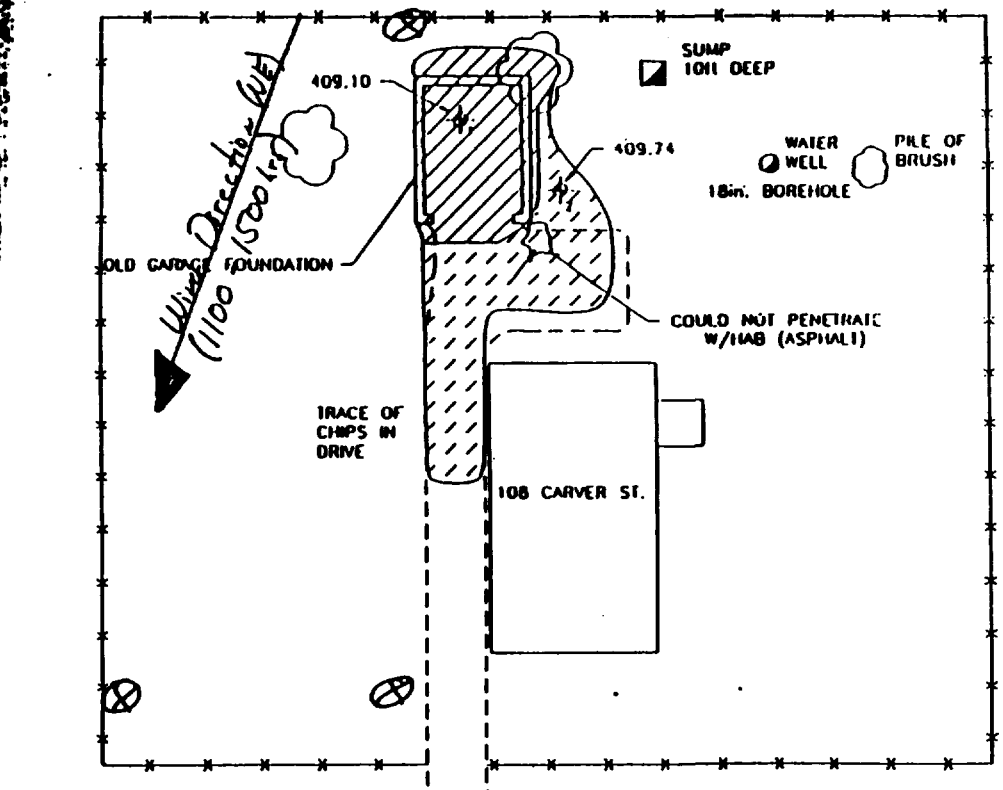
Mini Ram S/N #1 5397

June 7, 1993 High Volume Pump Locations Wind SW Temp 89° Hum 67%



#2 High Volume Pump Locations

High Volume Pump S/N #1 3296



LEGEND

SURFACE LOCATIONS OF BATTERY CASING MATERIAL
(EXTENT OF AREA ESTIMATED, WAS NOT FIELD SURVEYED)

- >50% SURFACE COVERAGE
- <50% SURFACE COVERAGE
- TRACE

Jeff Delhomme
4380

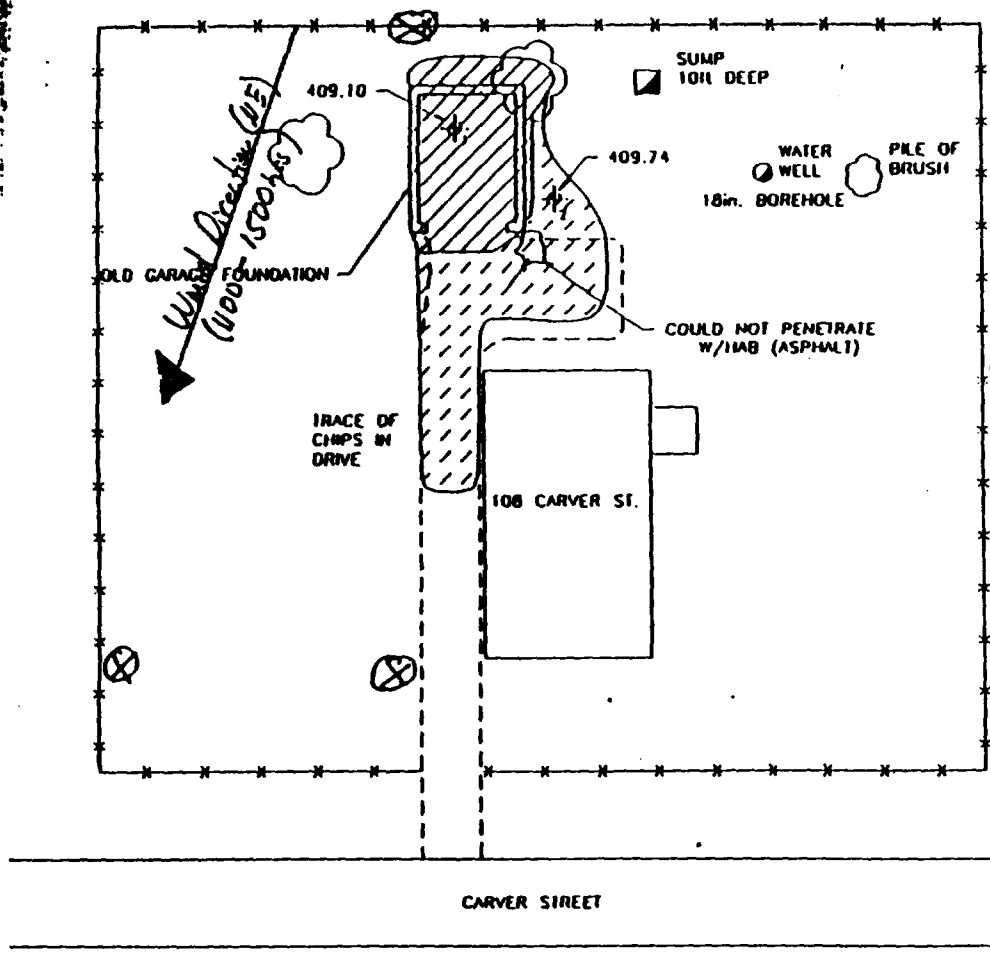
DRAFT

0 20 40
SCALE FEET

NL/TARACORP SUPERFUND SITE GRANITE CITY, ILLINOIS PRE-DESIGN FIELD INVESTIGATION	PROJECT NO 89MC114V
Woodward-Clyde Consultants	
DRN. BY: CH 7/14/92 DSGN. BY: CP CHKD. BY: CF	REMOTE FILL AREAS: 108 CARVER ST. (EAGLE PARK ACRES)
	FIG. NO 12

⊗ = High Volume pump Locations

~~Mission~~ High Volume Pump S/N #'s - 3118
2- 2964
3 2797



LEGEND

SURFACE LOCATIONS OF BATTERY CASING MATERIAL

>50% SURFACE COVERAGE

<50% SURFACE COVERAGE

TRACE

Back Ground - 2.42
Predetermined Avg - .14
Action Level 2.56
for Today

Jeff Delhomme
4380

DRAFT

0 20 40
SCALE FEET

NL/TARACORP SUPERFUND SITE
GRANITE CITY, ILLINOIS
PRE-DESIGN FIELD INVESTIGATION

PROJECT NO 89MC114V

Woodward-Clyde Consultants

DRN. BY: CM 7/14/92
DSGN. BY: ZP
CHKD. BY: CFF

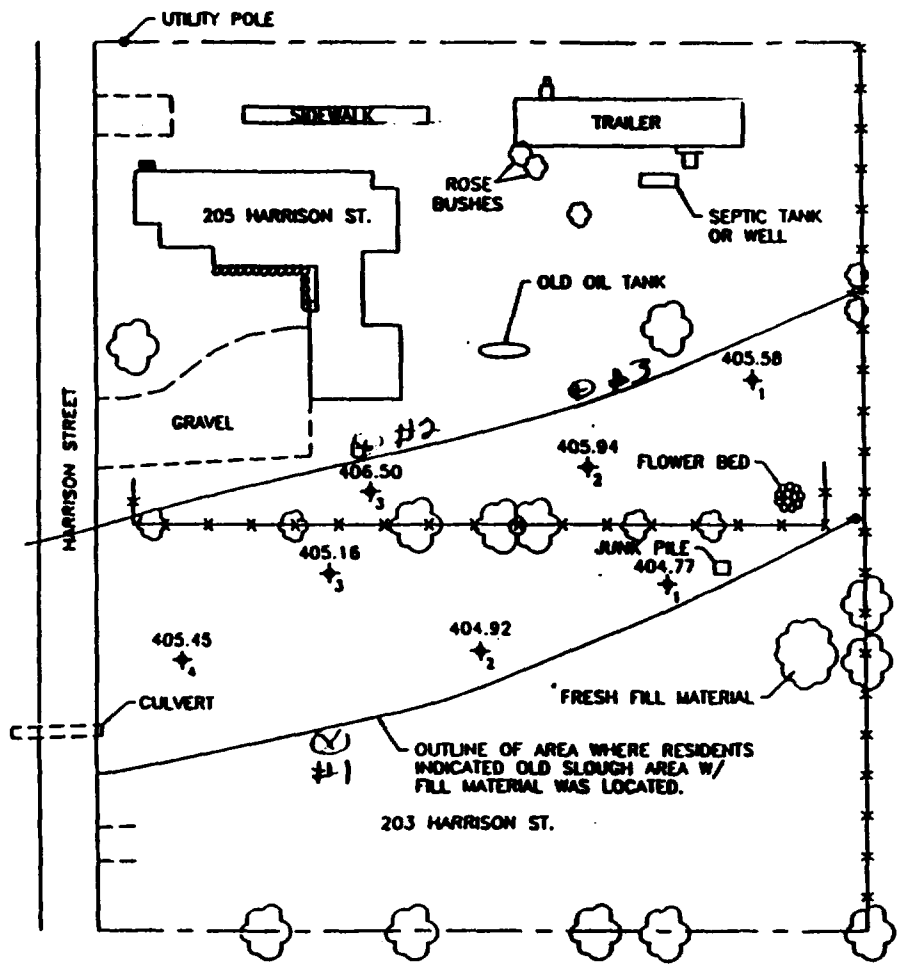
REMOTE FILL AREAS:
108 CARVER ST.
(EAGLE PARK ACRES)

FIG. NO 12

⊗ = Miniram Location for site Activities

Miniram S/N #1 - 4428
2 - 5427

June 12, 1993 High Volume Pump Locations Wind E Temp 58 Hum 42



Back Ground 2.95
Predetermined Ave .035
2.985

Wind E (0730 - 1130)

COMMENTS: NO BATTERY CASING MATERIAL PRESENT ON SURFACE

0 30 60
SCALE FEET

DRAFT

NL/TARACORP SUPERFUND SITE
GRANITE CITY, ILLINOIS
PRE-DESIGN FIELD INVESTIGATION

PROJECT NO 89MC114V

Woodward-Clyde Consultants

DRN BY: CU 7/14/92
DSGN BY:
CHKD. BY:

REMOTE FILL AREAS:
203/205 HARRISON ST.
(EAGLE PARK ACRES)

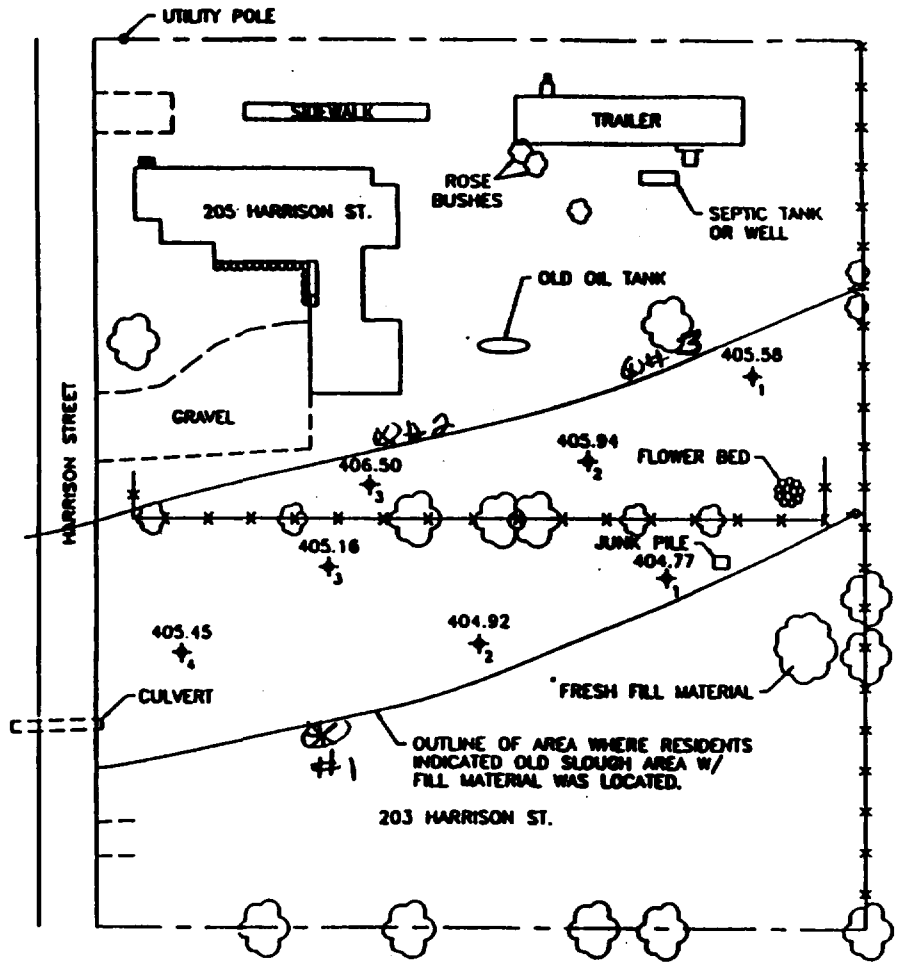
FIG. NO. 15

File name: C:\GRANITE\HARRISON.DWG Last edited: 92/09/11 @ 14:48

(X) High Vol Pump Locations

High Vol Pump S/N #1 3296
#2 3295

June 12, 1993 Mini Ram Locations for Site Activities Wind E Temp 88 Hum 42%



Wind direct E (0730 - 1130)

COMMENTS: NO BATTERY CASING MATERIAL PRESENT ON SURFACE

0 30 60
SCALE FEET

DRAFT

ML/TARACORP SUPERFUND SITE
GRANITE CITY, ILLINOIS
PRE-DESIGN FIELD INVESTIGATION

PROJECT NO 89MC114V

Woodward-Clyde Consultants

DRN. BY: CU 7/14/92
DSGN. BY:
CHKD. BY:

REMOTE FILL AREAS:
203/205 HARRISON ST.
(EAGLE PARK ACRES)

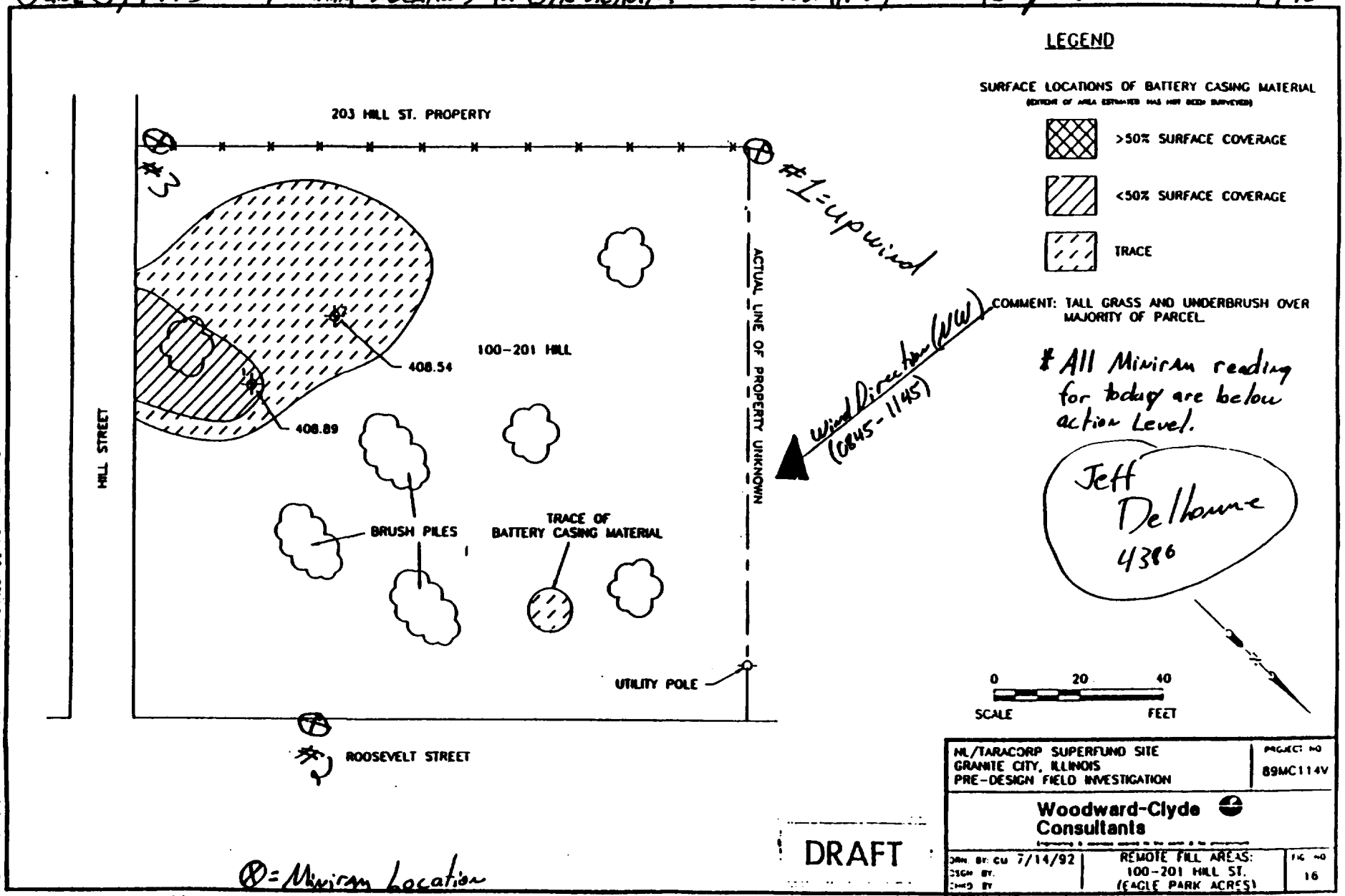
FIG. NO. 15

File name: C:\GRANITE\HARRISON.DWG Last edited: 92/09/11 @ 14:48

Mini Ram Locations

Mini Ram S/N 1/5397
#25428

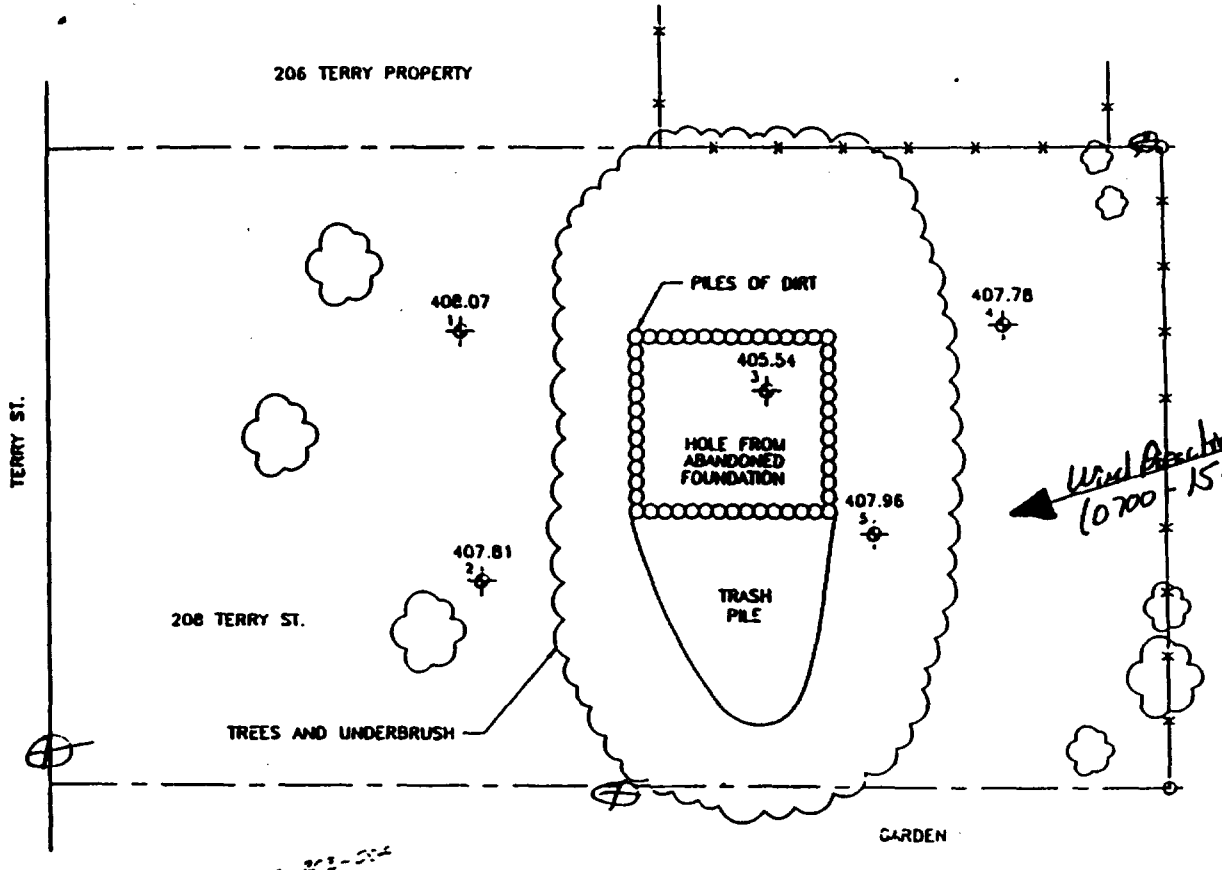
June 5, 1993 Miniram Locations for Site Activites Wind: (NW) Temps: 80° Hum: 17%



⊗ = Miniram Location

Miniram S/N #1-4703
4583

[redacted] 8/1993. MiniRAM Locations for Site Activities Wind: SE Temp: 93° Hum: 40%



Back Ground: .90
Predetermined Avg: .09
Action Level .99
for Today

Jeff Delhomme
4380

COMMENTS:

1. SURFICIAL TRACE OF BATTERY CASING MATERIAL COVERING WHOLE PARCEL.
2. TALL GRASS AND UNDERBRUSH OVER MAJORITY OF PARCEL.
3. NO FILL MATERIAL OBSERVED.

0 20 40
SCALE FEET

[redacted]

1-800-248-2550
618 656-5744

NL/TARACORP SUPERFUND SITE
GRANITE CITY, ILLINOIS
PRE-DESIGN FIELD INVESTIGATION

PROJECT NO 89MC114V

Woodward-Clyde Consultants

DRAWN BY: CW 7/14/92
DSGN BY:
CHKD BY:

REMOTE FILL AREAS
208 TERRY ST
(EAGLE PARK ACRES)

FIG. NO 18

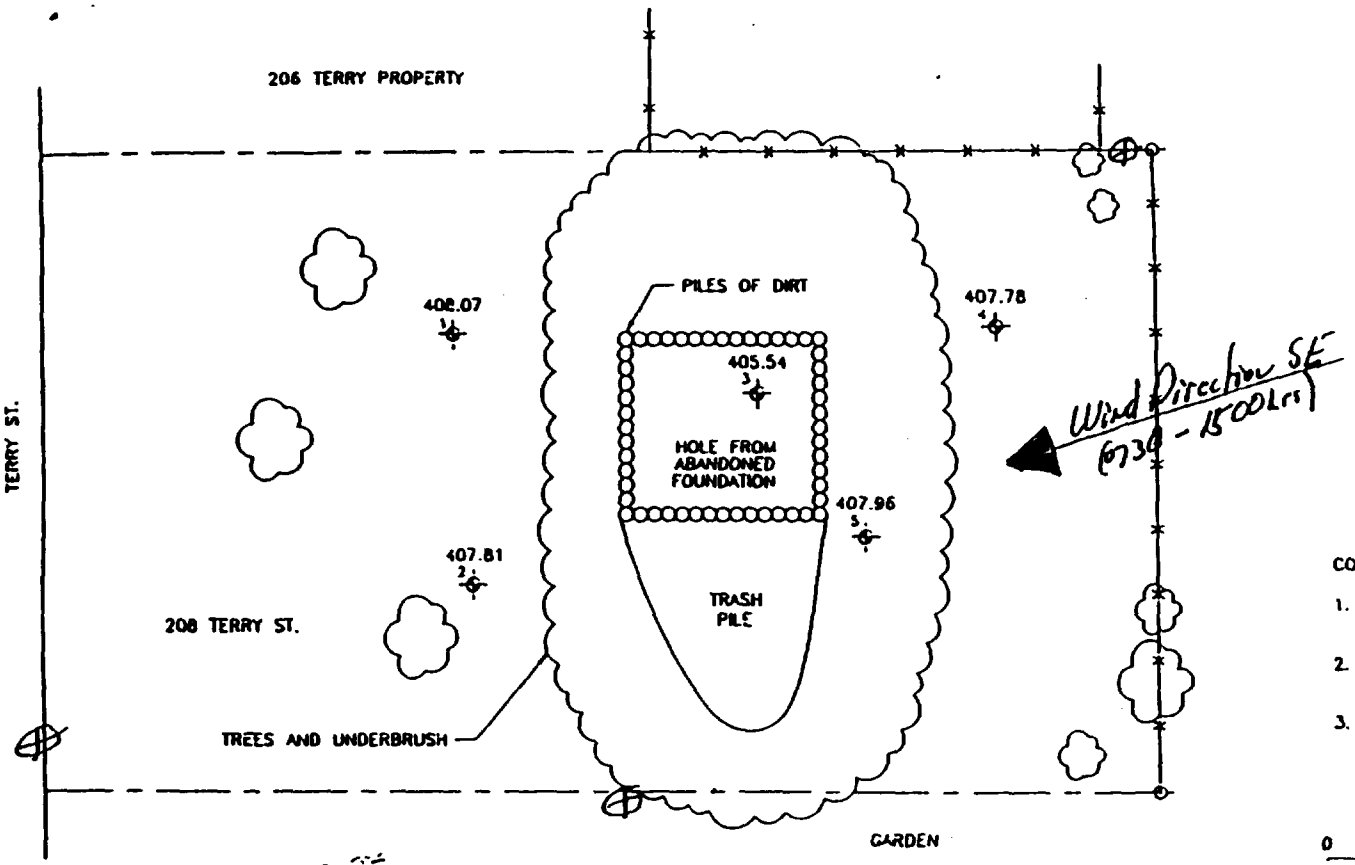
DRAFT

File name: G:\GRANITE\TERRY208.DWG Last edited: 92/08/11 @ 14:57

⊗ = MiniRAM Location for Site Activities

MiniRAM S/N: 1) 4428
2) 5427
3) 4583

June 28, 1993 High Volume Pump Locations Wind: SE Temp: 93° Hum: 40%



Jeff Dellhamer
4380

COMMENTS:

1. SURFICIAL TRACE OF BATTERY CASING MATERIAL COVERING WHOLE PARCEL.
2. TALL GRASS AND UNDERBRUSH OVER MAJORITY OF PARCEL.
3. NO FILL MATERIAL OBSERVED.

21-2-19-36-12-203-004

1-800-248-2850
618 656-5749

NL/TARACORP SUPERFUND SITE
GRANITE CITY, ILLINOIS
PRE-DESIGN FIELD INVESTIGATION

PROJECT NO. 89MC114V

Woodward-Clyde Consultants

DRAFT

DRN. BY CU 7/14/92
DSGN BY
CHKD BY

REMOTE FILL AREAS
#208 TERRY ST.
(EAGLE PARK ACRES)

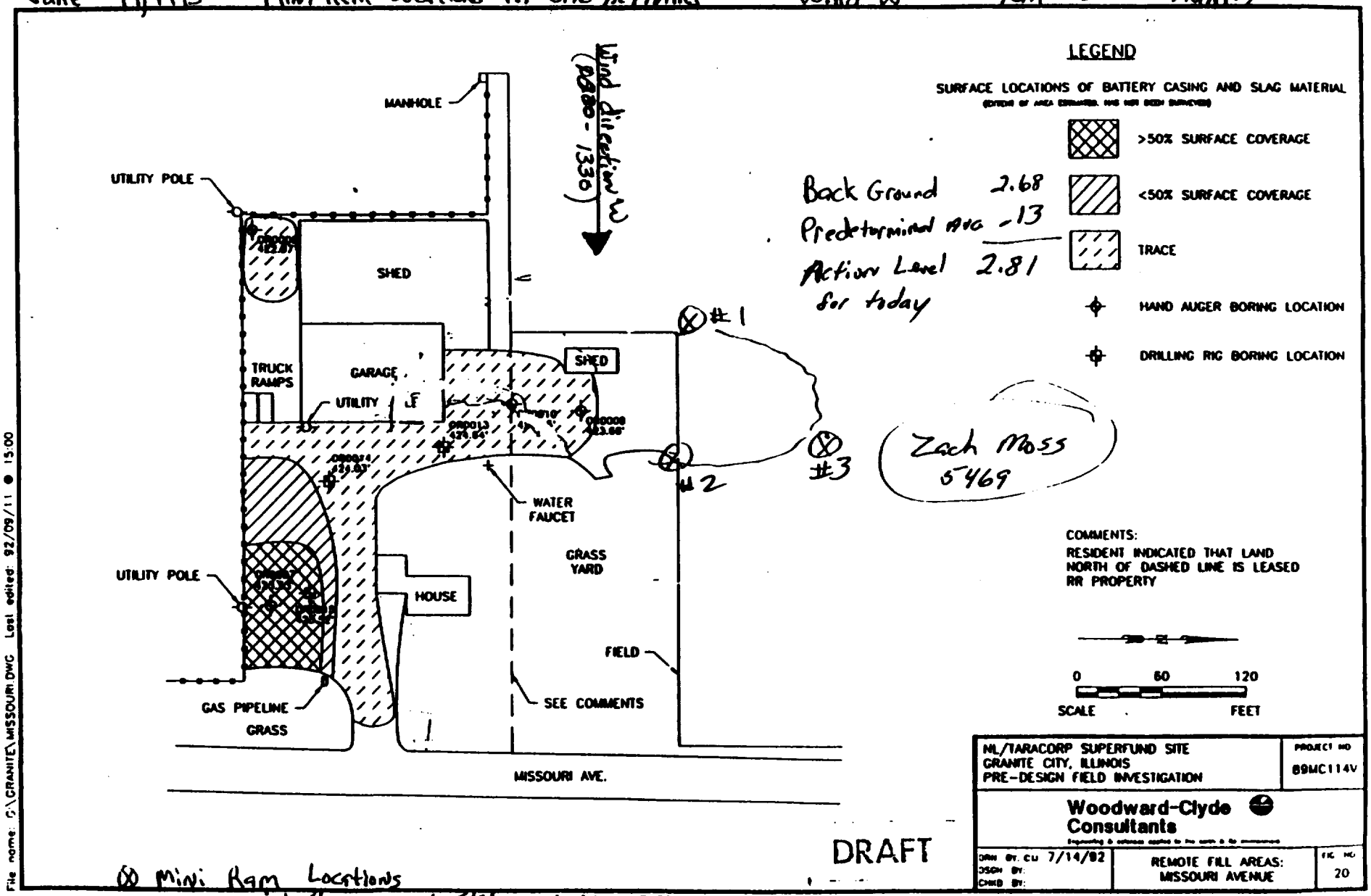
FIG. NO. 18

File name: G:\GRANITE\TERRY208.DWG Last edited: 92/08/11 @ 14:57

⊗ = High Volume Pump Location

High Volume Pump S/n: 1) 3118
2) 2489
3) 2147

June 14, 1993 Mini Ram Locations for Site Activities Wind W Tem 93. Hum 17



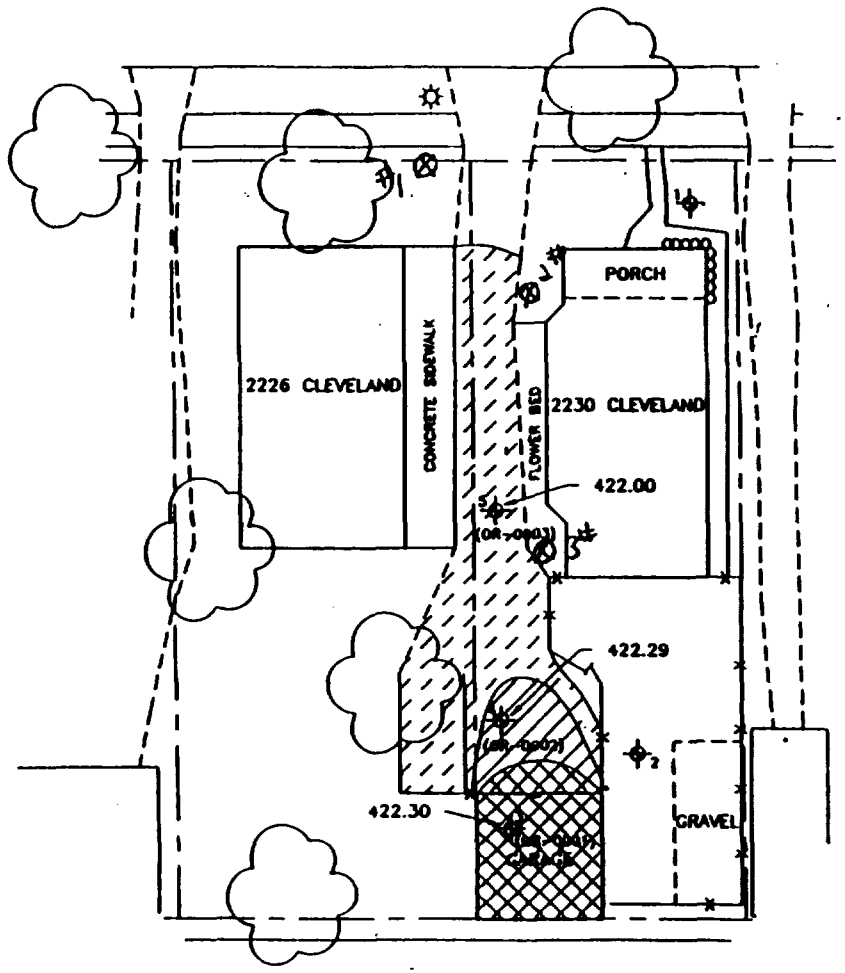
⊗ Mini Ram Locations

Mini Ram ~~test~~ S/N #1 5397

#2 5428

#3 11278

June 16, 1993 Miniram / tions



WIND DIRECTION 1330 - 1600

LEGEND

SURFACE LOCATIONS OF BATTERY CASING MATERIAL
(EXTENT OF AREA ESTIMATED, HAS NOT BEEN SURVEYED)

- >50% SURFACE COVERAGE
- <50% SURFACE COVERAGE
- TRACE

Background .00 mg/m³

Pre Aug - .10 mg/m³

Action Level .10 mg/m³

Mark Spakman 1817

0 20 40
SCALE FEET

NL/TARACORP SUPERFUND SITE
GRANITE CITY, ILLINOIS
PRE-DESIGN FIELD INVESTIGATION

PROJECT NO 89MC114V

Woodward-Clyde Consultants

DRN BY: CU 7/14/92
DSGN BY:
CHKD BY

REMOTE FILL AREAS:
@ 2230 CLEVELAND

FIG NO 23

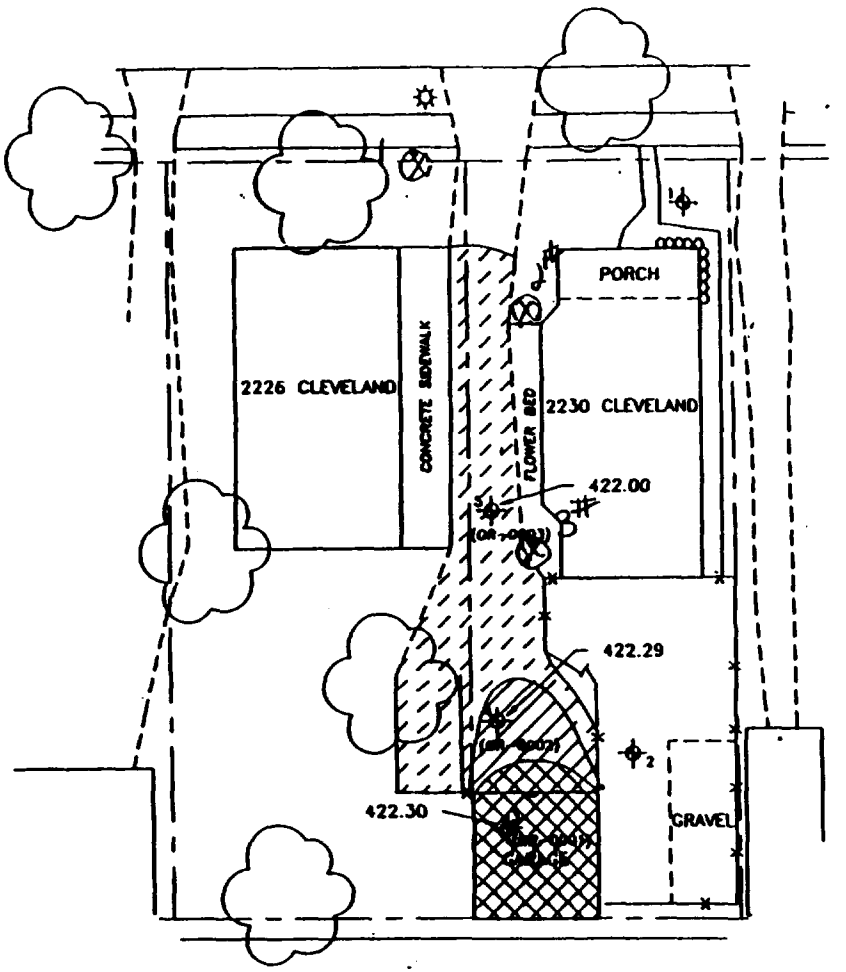
DRAFT

⊗ = Miniram Location

File name: C:\GRANITE\CLEVLAND.DWG Last edited: 92/09/16 @ 15:53

Mini Ram s/N # 1 - 3296
2 - 3295
3 - 2534

[redacted] 1993 H-11 Vol = 4 pump locations



LEGEND

SURFACE LOCATIONS OF BATTERY CASING MATERIAL
(EXTENT OF AREA ESTIMATED, HAS NOT BEEN SURVEYED)

- >50% SURFACE COVERAGE
- <50% SURFACE COVERAGE
- TRACE

WIND DIRECTION (1200 - 1600)

Mark Ackerman 1517

0 20 40
SCALE FEET

⊗ = High Vol. pump locations

DRAFT

NL/TARACORP SUPERFUND SITE
GRANITE CITY, ILLINOIS
PRE-DESIGN FIELD INVESTIGATION

PROJECT NO. 89MC114V

Woodward-Clyde Consultants

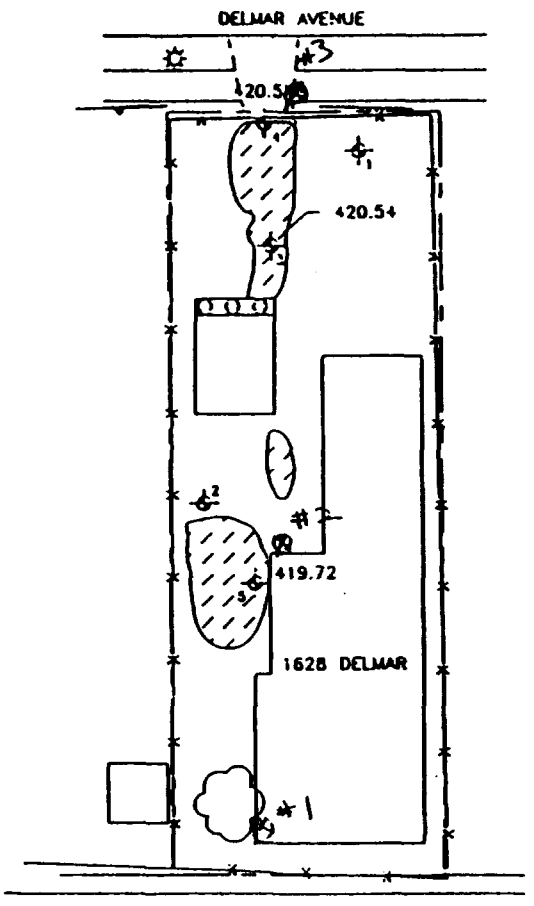
DRN. BY: CLI 7/14/92
DSGN. BY:
CHKD BY:

REMOTE FILL AREAS.
2230 CLEVELAND

FIG. NO. 23

File name: C:\GRANITE\CLEVLAND.DWG Last edited: 92/09/16 @ 15:53

1992-93 Mini Ram Locations Temp 92 W.N.O SE Hum 40%



WIND DIRECTION (0730 - 1600)

LEGEND

SURFACE LOCATIONS OF BATTERY CASING MATERIAL
(EXTENT OF AREA ESTIMATED, HAS NOT BEEN SURVEYED)

- >50% SURFACE COVERAGE
- <50% SURFACE COVERAGE
- TRACE

BACKGROUND .07 mg/m³

PRE AUG 1.7 mg/m³

ACTION LEVEL 1.8 mg/m³

Mark Atkinson 1617

0 20 40
SCALE FEET

NL/TARACORP SUPERFUND SITE
GRANITE CITY, ILLINOIS
PRE-DESIGN FIELD INVESTIGATION

PROJECT NO 89MC1114V

Woodward-Clyde Consultants

DRAWN BY CU 7/14/92
DESIGN BY
CHKD BY

ADDITIONAL REMOTE FILL AREAS 1628 DELMAR

FIG. NO. 4

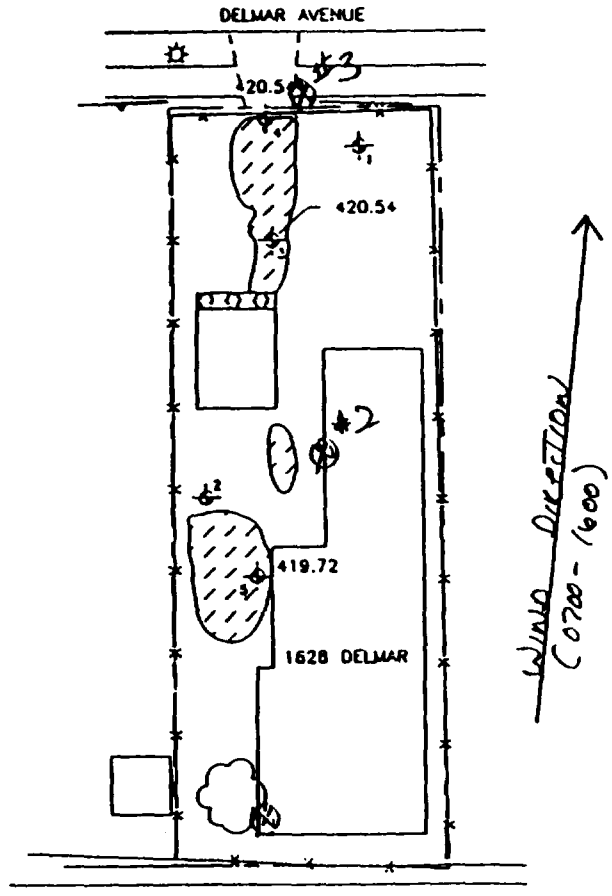
DRAFT

⊗ = Mini Ram Location

Mini Ram S/N #1 5799
#2 5797

File name: G:\GRANITE\DELMAR.DWG Last edited: 02/09/11 @ 14:53

6-23-93 High Volume Pump Locations Temp 92 Wind SE Hum 40%



LEGEND

SURFACE LOCATIONS OF BATTERY CASING MATERIAL
(EXTENT OF AREA ESTIMATED, HAS NOT BEEN SURVEYED)

- >50% SURFACE COVERAGE
- <50% SURFACE COVERAGE
- TRACE

Mark Sekman (817)

0 20 40
SCALE FEET

NL/TARACORP SUPERFUND SITE
GRANITE CITY, ILLINOIS
PRE-DESIGN FIELD INVESTIGATION

PROJECT NO 89MC114V

Woodward-Clyde Consultants

DRAWN BY CU 7/14/92
DESIGN BY
CHKD BY

ADDITIONAL REMOTE FILL AREAS. 1628 DELMAR

FIG NO 14

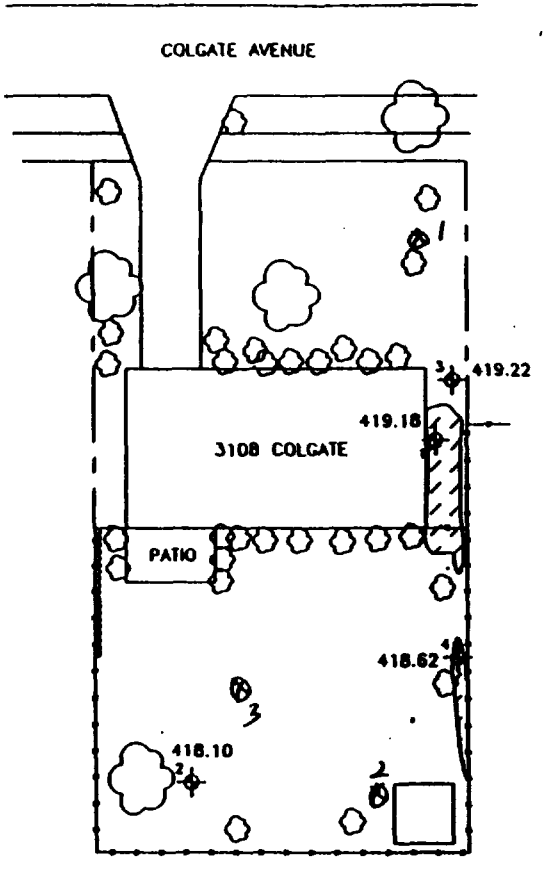
DRAFT

⊗ = High Volume Pump Locations

pump S/N # 1 - 3296

File name: G:\GRANITE\DELMAR.DWG Last edited: 92/09/11 @ 14:53

JUNE 15, 1993 MINI RAM LOCATIONS FOR SITE ACTIVITIES WIND: NE TEMP: 83° Humidity



WIND DIRECTION (060 - 150°)

LEGEND

SURFACE LOCATIONS OF BATTERY CASING MATERIAL
(OUTLINE OF AREA ESTIMATED, HAS NOT BEEN SURVEYED)

- >50% SURFACE COVERAGE
- <50% SURFACE COVERAGE
- TRACE

BACKGROUND - .00 mg/m³

PRE DETERMINED AVG - .51 mg/m³

ACTION LEVEL - .51 mg/m³

Mark Spaboun
8/17

0 20 40
SCALE FEET

N

⊗ = MINI RAM LOCATIONS

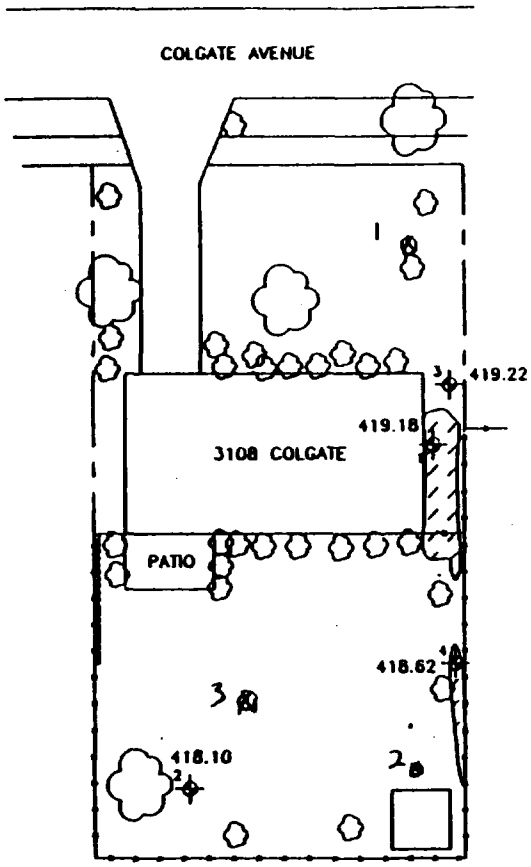
DRAFT

NL/TARACORP SUPERFUND SITE GRANITE CITY, ILLINOIS PRE-DESIGN FIELD INVESTIGATION		PROJECT NO. 89MC114V
Woodward-Clyde Consultants		
DRN BY: CU 7/14/92 DSGN BY: CHKD BY:	ADDITIONAL REMOTE FILL AREAS: 3108 COLGATE	FIG. NO. 25

File name: C:\GRANITE\COLGATE.DWG Last edited: 92/09/11 @ 14:38

MINI RAM S/N: #1 - 5317
#2 - 5428
#3 - 4378

JUNE 15th 1993 Aerial Volume Pump Locations Wind: NE Temp 83 - 11am 70°F



LEGEND

SURFACE LOCATIONS OF BATTERY CASING MATERIAL
(EXTENT OF AREA ESTIMATED WAS NOT BEEN SURVEYED)

- >50% SURFACE COVERAGE
- <50% SURFACE COVERAGE
- TRACE

Mark Stetson 1617

0 20 40
SCALE FEET

NL/TARACORP SUPERFUND SITE
GRANITE CITY, ILLINOIS
PRE-DESIGN FIELD INVESTIGATION

PROJECT NO. 89MC114V

Woodward-Clyde Consultants

DRN BY: CU 7/14/92
DSGN. BY:
CHKD. BY:

ADDITIONAL REMOTE FILL AREAS: 3108 COLGATE

FIG. NO. 25

DRAFT

File name: C:\GRANITE\COLGATE.DWG Last edited: 92/09/11 @ 14:58

⊗ = High Volume pump Location

pump SN = 1# 3296
2# 3295
3# 2534